

## ABSTRACT

2        A sparging system for in-situ groundwater remediation for removal of contamination  
including dissolved chlorinated hydrocarbons and dissolved hydrocarbon petroleum products  
4 including the use in injection wells of microfine bubble generators, matched to substrates of  
selected aquifer regions, for injection and distribution of said bubbles containing oxidizing gas  
6 through said aquifer and to selectively encapsulating gases including oxygen and ozone in duo-gas  
bubbles which, in the presence of co-reactant substrate material acting as a catalyst, are effective  
8 to encourage biodegradation of leachate plumes which contain biodegradable organics, or Criegee  
decomposition of leachate plumes containing dissolved chlorinated hydrocarbons.

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